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A contribution to the History of Artificial Immunity.—By SURGEON-
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In these modern times when so much advance is being made in medicine, in the direction of the establishment of immunity against various toxic principles by the gradual habituation of the system to increasing doses of the virus, and then utilising the serum of the blood of animals in whom immunity has thus been established, for the "Vaccination" as it is conveniently termed of other non-protected animals, in many cases with complete success, it is not unworthy of us to enquire whether this is a newly discovered principle or whether it is merely a revival or development of a principle known to former ages.

The latest development of the principle of *antitoxine* immunity is the application of the method by which their presence in the serum is ensured, to snake poisoning.

Dr. Fraser of Edinburgh has found a means of so modifying the tissues of a non-protected animal, by gradually accustoming the organism to increasing doses of snake venom, that it not only exhibits certain resistance to even fifty times the minimum lethal dose, but also that the serum of the blood of these immune animals acquires the property of acting as an antidote to the snake poison in other animals. To procure this condition of the blood the usual method is to inject the venom subcutaneously, but Dr. Fraser has also succeeded in immunising cats by the administration of cobra venom by the stomach, and it is this special fact which has led me to the consideration of the

methods in use centuries ago for this same purpose: that is to say, for the prevention or cure of poisoning by snake venom.

We know that centuries ago (about 450 B. C.,) Herodotus wrote about a people named the Psylli (ψύλλοι) living on the shores of the Greater Syrtis who were said to be masters of a secret art enabling them to secure themselves against the bites of venomous snakes. Another people, the Marsi of Central Italy, are said to have possessed the power of so charming venomous reptiles as to render them innocuous. This power, though chiefly exercised by their priests, is said to have been possessed in common by the whole nation. Thus Virgil (*Æn.* vii. 750) writes:—

Quin et Marrubiâ venit de gente sacerdos
Fronde super galeam et felici comtus olivâ
Archippi regis missu, fortissimus Umbro:
Vipereo generi, et graviter spirantibus hydrys
Spargere qui somnos, cantuque manuque solebat,
Mulcebat que iras, et morsus arte levabat.

Even at the present day their descendants are to be found in and about Naples, who as itinerant snake charmers, claim to have inherited the same occult powers as their ancestors.

The Hawwâs of modern Egypt, also lay claim to these same powers, so that although it has rather been the custom to regard this class of people as charlatans and their claims as absurd, it is, in view of the recent results obtained by Dr. Fraser, of no little interest to examine a little more closely and try to obtain a clue to the methods pursued in various ages to procure immunity against snake poison.

As a slight contribution to this I propose to put forward a fact which has perhaps not received the attention it deserves, though it is well known. I allude to an ingredient of the celebrated ترياق or Snake-antidote of Persia.

The composition of this famous antidote is ascribed to Feridûn, king of the Peshdadian dynasty of Persia. The Arab historians however assert that the best ترياق فاروق "the selective antidote" was that of 'Irâq or Baghdâd, and that the Khalifah Al Mutawakkil (232-247 A.H.) was in possession of a ترياق of such approved virtue that he was in the habit of causing people to be bitten by venomous serpents, so that he might display the properties of his antidote which cured the sufferers on the spot. The proverb in Persian:

قاترياق اذعراق آوردہ شود مارگزیدہ مردہ بود

While the tiryâq is being fetched from 'Irâq the snake bitten victim becomes a corpse.

is of constant application to remedies applied too late.

There can be no doubt that this *ترياق* acquired a great reputation as a certain remedy for snake bite, and although its virtues may have been exaggerated, there is no reason for attributing to it the quality of uselessness, so that it really amounts to this, that the ancients were undoubtedly in possession of a means of counteracting the poison of venomous snakes.

Up to the present our position has been very different, in spite of all the labour which has been expended we have never as yet in modern times, at least, so far as the history of medical science goes, possessed a reliable remedy for snake bite. The effectual bite of a venomous snake has meant certain death. Our greatest authority, Sir Joseph Fayrer, states that after long and repeated observations in India and subsequently in England, he has been forced to the conclusion that all the remedies hitherto regarded as antidotes to snake poison are absolutely without specific effect upon the condition produced by the poison.

If then the ancients had so much the better of us, it is worth our while to find what clue to the solution of the problem we can gain from their practice.

The statements regarding the constitution of this famous *ترياق* are very few and very vague.

But I have happened in the course of reading to light upon a passage in an Old Arabic MS. in the library of the College of Fort William, which throws a most interesting light upon the subject, and tends to corroborate the results obtained by Dr. Fraser. The passage I refer to runs as follows:—I quote it in full though the part referring to the etymology of the word *ترياق* is common knowledge—

[The quotation is from a MS. (No. 194.) called *بحر الجواهر* (*Ocean of Pearls*) of date 937 H. (1530 A.D.) the author being Muḥammad ibn-Yūsuf, the physician, of Herát. The MS. bears date 1114 H. (1702 A.D.) according to the colophon it is the work of one Háfiz Muḥammad Husain ibn-Háfiz 'Alí who copied it for his own use. The place where he copied it is not stated.]

“The word *ترياق*” writes our author “is a Greek word derived from the word *تريوق* which is the name given to that which is venomous among animals, such for instance, as vipers and similar serpents. It is said that the *ترياق* (*tiryáq*) is only so called after the flesh of vipers has been cast into it, and then only because the viper is one of the venomous class of animals. One of the learned doctors states that the word *ترياق* is derived in the Greek language from the name given to biting animals (*ذوات النهرش*) and venomous animals (*ذوات السموم*)

which in their language are called **ترياق**¹ and also from the name of the medicine for fatal poisons, because this medicine is of use for all those kinds of poison. Accordingly it was named **ترياق**. The Arabs corrected this and called it **الترياق**. (*The antidote kar' éξοχήν.*) The Táǵ² states that it is only called **ترياق** because it contains the slaver (venom) of serpents (**ريق الحيات**). Al Jauharí says, "The word **ترياق** is an Arabicised Persian word meaning an antidote for poisons, the Arabs call wine **ترياق** because it dispels grief," and in the Talkhís³ it is called **الترياق** Al-taryáq (with fatha) and **ترياق الفاروق** Taryáq al Farúq *the selective (or discriminating) antidote*; also **ترياق الإفاعي** Tiryáq al Afá'í and **ترياق الأكبر** Tiryáq ul Akbar, *the chief antidote*. This is that which restores the spirit of one who is suffering from the effects of poisonous drugs, to its normal condition. It takes four years in its preparation, and must not be used before that time has elapsed; it lasts from four to thirty years: the freshly prepared is efficacious in all cases, but in from thirty years to sixty years it becomes old and weak. The old **ترياق** resembles an old man, and the freshly prepared is like the youth.

The **ترياق الأربع** (*tiryáq ul arba'*) is compounded of four ingredients.

The **ترياق الثمانية** (*tiryáq ul Ṣamāniya*) is compounded of eight ingredients and is far more efficacious than the **ترياق الأربع** (*tiryáq ul arba'*).

The **ترياق المسجانيين** (*tiryáq ul majánín*) is the name given to the flesh of hedgehogs, because it is good for sufferers from epilepsy and melancholia."

As to the other ingredients of this **ترياق** we have little or no information. Lane in his Lexicon states, that it contained "the best sort of Jew's pitch," *i.e.*, asphaltum, also called **موميا** *múmiá*: but the mere fact that the presence of either the flesh of vipers or their venom was indispensable shews that this was looked upon as the active ingredient, and it certainly appears that the administration of serpent venom as a means of establishing immunity against the bite of venomous snakes was known centuries ago.

¹ **تريون** *θηριον* (?)

² **تاج العروس** date 709 H.

(H. K.)

³ Talkhís fil Lughat, by Abu Hilál Hasan ibn-Abdullah Askerí, died 395 H.

(H. K)